CHAPTER 2

DESIGN CONSIDERATIONS

2-1. Design.

a. Coordination. Improper design and careless construction of various drainage structures may render facilities ineffective and dangerous to safe operation. Care should be given to both preliminary field surveys which establish control elevations and to construction of the various hydraulic structures in strict accordance with proper design procedures. A successful drainage system can only be obtained by coordination on the part of both the field and design engineers.

b. Surface and subsurface drainage systems. The installation of systems for drainage of surface runoff collection and subsurface water collection into one system of pipes serving this dual purpose is not recommended. Once the subsurface water has been collected and "daylighted" however, further disposal of this water can be directed to the storm drainage disposal system. The subsurface drains should enter the storm system at open channels (or gravity mains) well above the expected high water line of the storm system. Special attention must be given to preventing any backflow from the storm system to the subsurface drainage system.

c. Fuel drainage. Fuel spillage will not be collected in storm sewers. Safe disposal of fuel spillage may be facilitated by the provision of ponded areas for drainage so that any fuel spilled can be removed from the water surface. Bulk-fuel-storage areas will not be considered as built-over areas. Curbs, gutters, and storm drains will not be provided for drainage around tank-car or tank-truck unloading areas, tank-truck loading stands, and tanks in bulk-fuel-storage areas.

2-2. Drainage outfall considerations.

Local laws vary as to the responsibility of upstream property owners for the damage created by artificial drainage on downstream property. The construction of new runways or heliports and the modification or expansion of existing facilities, although designated as temporary, may cause permanent changes in the area's natural drainage patterns. Local laws and practices should be considered in the drainage system design.

2-3. Initial and deferred design and construction.

a. Initial design. The initial design and construction will consist of those items necessary for placing the facility in operation and maintaining uninterrupted service. These items will include all drainage and subdrainage, piping, under or immediately adjacent to runways, taxiways, aprons, helicopter pads, roadways, streets, open storage, and railroads. All inlets and box drains located in paved

areas, and open channels necessary to remove water from the immediate area of the facility are also included. The initial stage will be completed within the 180-day mobilization program.

b. Storm and subdrainage systems planning. During the initial design stage the complete storm and subdrainage systems will be planned. However, the detailed design and construction of certain structures associated with these systems can be deferred. These structures including drop structures, check dams, chutes, and stilling basins serve the purpose of handling the runoff and final disposal of excess water. The primary function of proper handling of excess water is the erosion control surrounding the facility but not directly associated with the operation and safety of that facility. For instance, open channels can be constructed and operated without check dams for short periods of time. The installation of check dams however has only been deferred, for erosion of the open channel will occur in time which must be corrected and dams built. It is anticipated that the emergency mobilization program would be in its final stages before the deferred structures are needed, and the construction of these items would not be time critical. Headwalls in general should be deferred, but certain critical conditions may exist where the safety of runways, roads, railroads, and other facilities could be jeopardized by headwall exclusion. These areas would require headwalls to be included in the initial design and construction stage.

c. Deferred structures. Deferable structures are discussed in part six of this manual. It must be cautioned that these structures are only deferred for a short time, not eliminated.